

**Claims**

1. A device for externally estimating the temperature of the liquid contents of a container with a concave base, comprising a support means with at least one contacting portion for contacting the concave base of said container such that a space is thermally enclosed by the concave base and the support means, a temperature probe which is positioned within the support means such that in use the probe may measure the temperature within the thermally-enclosed space, and a suitable system for receiving temperature information from the temperature probe and displaying the estimated temperature of the liquid contents within the container.
2. The device of claim 1, wherein the contacting portion of the support means is capable of contacting the perimeter of the concave base of the container.
3. The device of claim 2, wherein the contacting portion forms a raised ridge projecting from the support means such that it may deform around and make contact with any uneven surface on the perimeter of the base of the container.
4. The device of claim 3, comprising 2 or more concentric contacting portions suitable for contacting base perimeters of various sizes of container.
5. The device of claims 1-4, wherein the contacting portion of the support means is made of an insulating deformable material.
6. The device of claims 1-5, wherein the support means comprises a guide portion for guiding the placement of the base of the container onto the contacting portion of the support means.
7. The device of claims 1-6, wherein the temperature probe is connected to suitable electronics for measuring and displaying, in use, the approximate temperature of the liquid contents of the container.
8. The device of claims 1-7, wherein the temperature probe is a thermocouple comprising a first and a second metal.
9. The device of claim 8, wherein the first metal is copper and the second metal is constantan.
10. The device of claims 1-9, wherein the temperature probe in use projects from the support means into the space enclosed by the concave base of the container and the support means.

11. The device of claim 10, wherein the temperature probe in use projects from the support means through an elongate projecting means.

5 12. The device of claim 11, wherein the elongate projecting means is positioned such that, in use, it projects the temperature probe towards the centre of the concave base of the container.

13. The device of claims 10-12, wherein the temperature probe is positioned such that in use it is in thermal contact with the surface of the concave base of the container.

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14. The device of claim 13, wherein the temperature probe in use is in thermal contact with the surface of the concave base of the container through at least one flexible extension made of a material with good thermal conductivity and extending laterally from the temperature probe.

15 15. The device of claim 14, wherein the flexible extension is made of a resilient sheet of metal, optionally phosphor bronze or copper.

16. The device of claims 11-15, wherein the elongate projecting means is longitudinally compressible by application of the container to the device.

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17. The device of claim 16, wherein the elongate projecting means is capable of compressing to the level of or below the exterior surface of the support means which, in use, defines the space enclosed by the concave base of the container and the support means.

25 18. The device of claim 16 or 17, wherein the elongate projecting means is telescopically arranged.

19. The device of claims 16-18, wherein, in use, the elongate projecting means is resiliently biased towards the concave base of the container.

30 20. The device of claims 11-19, wherein the temperature probe is thermally insulated from the elongate projecting means.

21. The device of claims 11-20, wherein the elongate projecting means integrally comprises a first electrical conduit connecting the temperature probe with suitable electronics for measuring and  
35 displaying, in use, the temperature of the contents of the container.

22. The device of claim 21, wherein the elongate projecting means is longitudinally compressible by application of the container to the device and is biased towards the concave base of the container through resilient biasing means which is electrically insulated from the elongate projecting means, and wherein said resilient biasing means integrally comprises a second electrical conduit connecting  
5 the temperature probe with suitable electronics for measuring and displaying, in use, the temperature of the contents of the container.

23. The device of claim 22, wherein the temperature probe is a thermocouple comprising a first and a second metal, being in electrical contact with first and second electrical conduits which are made of  
10 the same respective metals, said metals being optionally selected from copper and constantan.

24. The device of claims 1-23, arranged such that in use the container is placed vertically on the support means, wherein gravity allows the base of the container to contact the contacting portion of the support means.  
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25. The device of claims 1-23, arranged such that in use the container is placed horizontally on the support means, wherein the device further comprises retaining means for keeping the base of the container in contact with the contacting portion of the support means.

20 26. The device of claims 1-25 suitable for externally estimating the temperature of the liquid contents of a bottle, such as a wine bottle.

27. A fridge, freezer, or heated incubator fitted with the device of claims 1-26.

25 28. A method of externally estimating the temperature of the liquid contents of a container comprising the steps of placing a container comprising liquid contents onto the device of claims 1-25 or onto the device fitted to a fridge, freezer, or heated incubator of claim 27, and reading the estimated temperature.

30 29. A method of decreasing the temperature of the liquid contents of a container to a particular temperature at or above the ambient temperature of a fridge or freezer comprising the steps of placing the container onto the device fitted in the fridge or freezer of claim 27, measuring the decrease of temperature in the liquid contents of the container, and removing the container from the fridge or freezer when the particular temperature has been reached.  
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30. A method of increasing the temperature of the liquid contents of a container to a particular temperature at or below the ambient temperature of a heated incubator comprising the steps of placing the container onto the device fitted in the heated incubator of claim 27, measuring the increase of temperature in the liquid contents of the container, and removing the container from the heated incubator when the particular temperature has been reached.

31. A method of externally measuring the temperature of the liquid contents of a container with a concave base comprising the steps of inserting a temperature probe into the space within the concave base of the container and measuring the temperature as an estimation of the temperature of the liquid contents of the container.

32. The method of claim 31, wherein the temperature probe is a thermocouple, a resistance thermometer or a thermistor.

33. The method of claim 31 or 32, wherein the temperature probe is inserted into the space within the concave base to an extent that it makes thermal contact with the surface of the container, preferably at the apex of the concave base.

34. The method of claims 31-33, further comprising the step of thermally enclosing the space within the concave base of the container.

35. The method of claims 31-34, wherein the temperature measurement is made when the container is present within a fridge, freezer or heated incubator which has a different ambient temperature to the liquid contents of the container.

36. The method of claim 35, wherein several temperature measurements are made to follow the change of temperature of the liquid contents of the container over time.

37. The method of claims 31-36, wherein the device of claims 1-26 is used to estimate the temperature of the liquid contents of the container.

38. A device, fridge, freezer or heated incubator, constructed and arranged substantially as herein described, with reference to and as illustrated in the accompanying drawings; or a device, fridge, freezer or heated incubator according to any one of claims 1 to 27, substantially as hereinbefore described, with reference to the accompanying drawings.